

Powering clients to a future shaped by growth

A Frost & Sullivan Executive Brief

Impacts of Sustainability and Automotive CASE Implications on Cutting Room Value Proposition

In collaboration with

LECTRA



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Introduction: Road to Sustainability

Road to Sustainability and Circular Economy

All industries grapple with sustainability, but the automotive industry has unique challenges to overcome. The most obvious challenge comes from the use of internal combustion engines, which emit about 4.6 metric tons of carbon dioxide per year. This fact has led to the perception that the industry is one of the major contributors to global emissions.

Specifically for interiors and seating, automotive original equipment manufacturers (OEMs) now offer sustainable, animal-product-free alternatives in response to consumer demand for increased attention to climate impact. Customers are increasingly concerned with the origin and manufacturing process of their products, including the ethical treatment of animals—a vital element of the leather value chain.

As manufacturers shift from linear production to a circular economy, final products should be more recyclable and reintroduce environmentally relevant materials into the manufacturing process. This trend encourages the development of new business models and industrial ecosystems across all vehicle elements, such as seat fabrics and electric vehicle (EV) batteries, which will be crucial to long-term competitive positioning and profitability.

Furthermore, vehicle buyers would like to see more sustainable applications in vehicle interiors, particularly plastics and upholstery. This increased demand for customised interiors and created an opportunity for higher-margin sales, resulting in cost challenges with high-quality, customisable leather interiors at increasingly competitive prices.



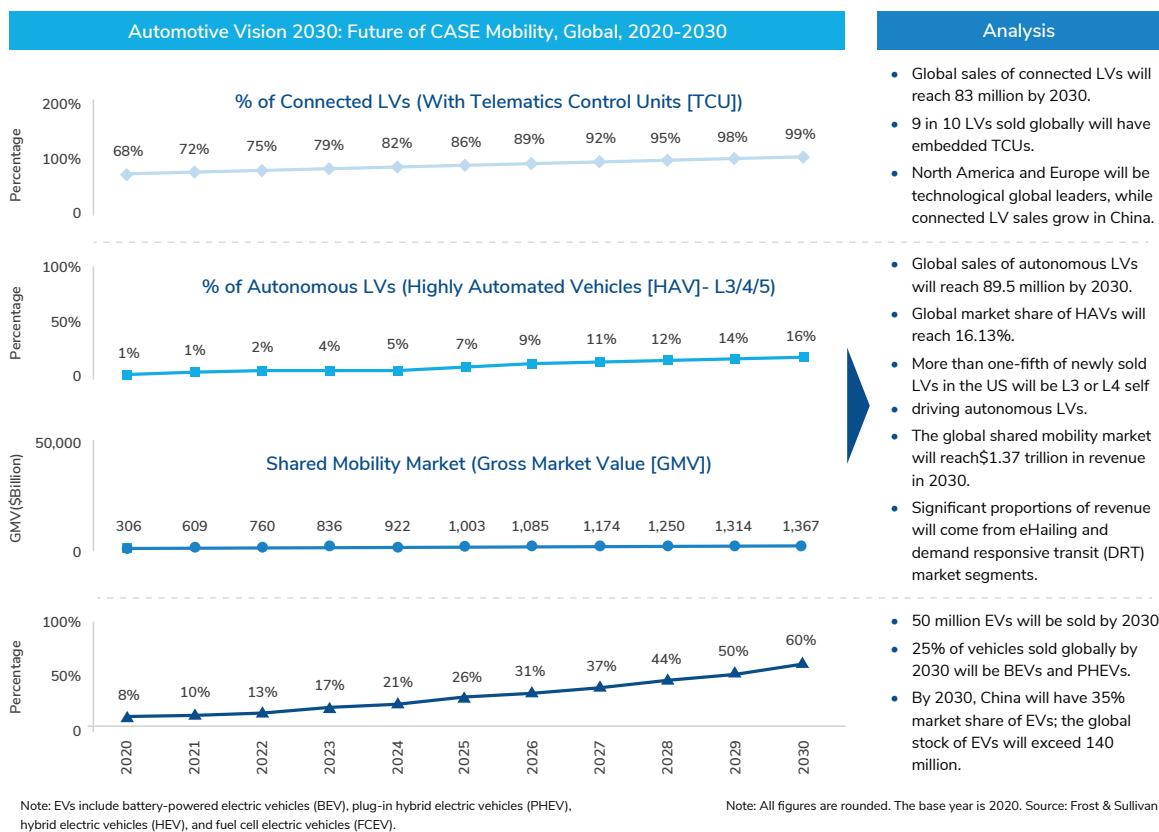
Implications from the Automotive Industry CASE Convergence

The automotive ecosystem is changing rapidly with new business models and connected, autonomous, shared, and electric (CASE) mobility trends. Sub-trends and service markets related to these trends are shaping the industry’s future and creating new business opportunities for OEMs, suppliers, mobility participants, and start-ups. By 2030, the automotive ecosystem will see extensive market consolidations and partnerships.

Suppliers and dealers will likely follow OEMs’ shifting focus towards electric and autonomous cars. OEMs emphasise hyper-personalisation, convenience, and individual well-being with technologies such as biometrics, in-vehicle entertainment and commerce, and cloud-based data analytics. All features affect a vehicle's interior design and material use, and next-generation vehicles will become a connected extension of the living and working space.

According to Frost & Sullivan’s “2030 Vision of the Automotive Industry” study, 50 million EVs, 18 million L2/L3/L4 autonomous vehicles, and \$1.37 trillion in shared mobility opportunities will reshape the industry to complement connected car growth.

Global Case Opportunities and Penetration



The electric and autonomous car-sharing ecosystem will become part of a larger, integrated, multimodal ecosystem that emphasises highly customised, seamless, and on-demand transportation services. These services will reshape automotive customer demand and drive an agile realignment of new vehicle features that comply with sustainability targets.

CASE trends, post-COVID-19 implications, new customer needs, and OEM demands, such as the following, will challenge seating and interior materials (such as leather and fabrics):

- Light-weighted materials that match next-generation needs must maximise battery performance and vehicle range
- Greener materials must be produced via a circular, environmentally friendly, and sustainable value chain
- Interactive and touch-sensitive surfaces should address new connectivity requirements and in-vehicle human-machine interfaces
- Materials that can be easily disinfected and have increased resistance will address new post-COVID-19 customer sensibilities
- Materials that complement well-being technology will be embedded in vehicles, such as driver health monitor sensors in seats
- Materials with highly customisable and experiential features will target premium and luxury clients

Leather Path to CASE

Material technology and feature selection will be driven by automotive application segments and strategic rationale from a manufacturing or consumer perspective



Furthermore, CASE convergence will compel automotive industry consolidation to achieve economies of scale and to share R&D expenditure and investment in homogenised vehicle platforms and components, such as cockpit and seat structure. Further customisation will ensure brand differentiation, which is integral to groups that wish to remain profitable in the next 10 years as competition increases in Europe and the Americas (e.g. Chinese OEMs and smart EV start-ups).

Solution and Benefits to Increase Interior Sustainability

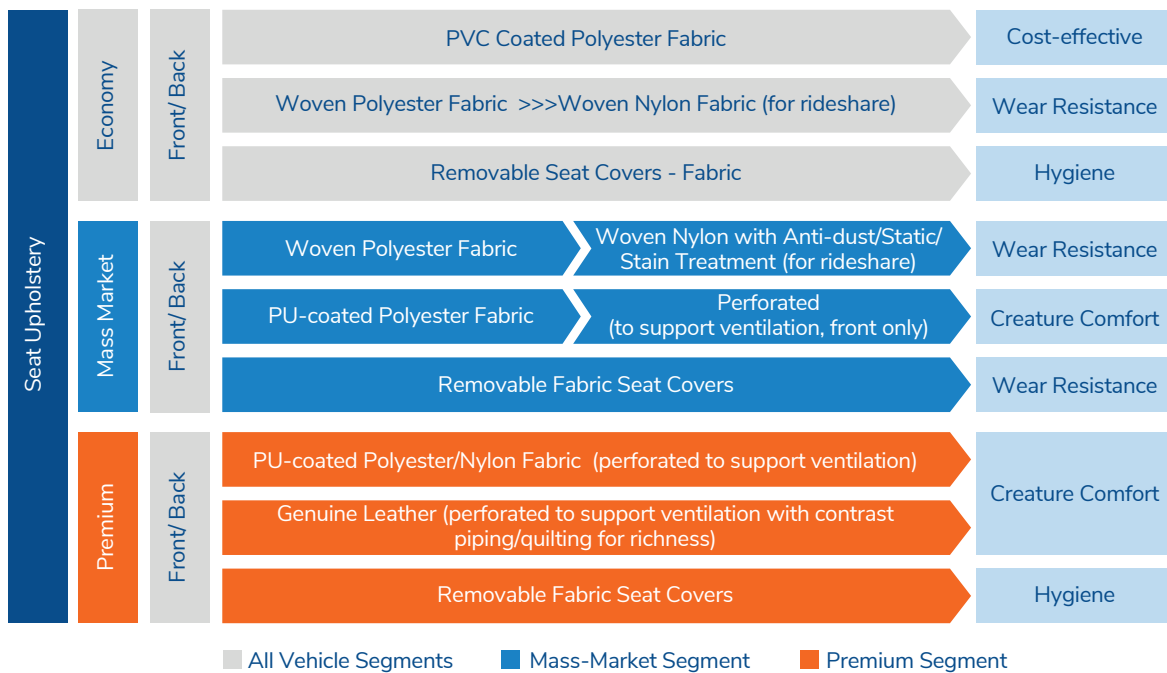
Sustainability Best Practices Pertaining to Vehicle Seats

New fabrics will gain additional momentum through EV adoption as automotive manufacturers continue trying to meet sustainability goals. Luxury materials, including leather, are still popular in certain segments, but even luxury consumer demand is trending towards non-animal-based leather.

To reduce their environmental footprint, fabric suppliers should focus on low power consumption technology and comply with global safety and environmental emission regulations. Other practical solutions include installing automatic energy-saving consumables, permanent bristle block cleaners, and auto-restart functions (in the case of power failures) to help minimise electricity use.

Seating Material Technology Tree

Material technology and feature selection will be driven by automotive application segments and strategic rationale from a manufacturing or consumer perspective



Manufacturers are redesigning all vehicle elements to be more sustainable. While many view genuine leather as the superior choice for automobiles (especially in the luxury segment), automakers are heeding consumer concerns and seeking out materials that use fewer chemicals, use less water, and produce less CO₂ emissions.

Alternative leather solutions such as synthetic leather (also known as leatherette) are emerging and becoming a selling point for luxury automakers, particularly in EVs. The challenge with these is finding premium materials that allow for large volume production, feel just like leather, and are as durable.

Audi, BMW, Mercedes Benz, Jaguar, and Volvo now offer non-leather trims as standard for seats and offer leather as an expensive option on fewer models. Since 2017, Tesla has only offered non-leather seat trims.

In terms of non-leather substitutes, Mercedes offers a fibre textile made from a natural eucalyptus material. Eucalyptus Melange is a regenerated fibre that makes a lightweight, sumptuous, and durable material that conserves resources. Eucalyptus grows quickly and requires less water than the plants normally used to make similar materials. Another Mercedes fibre is Dinamica, a sustainable and recyclable premium microfibre suede made from old clothes, plastic bottles, and flags.

Volkswagen uses AppleSkin, a bio-based leather-style fabric derived from waste apple skins from juice production. The resulting material is approximately 20% to 30% apple, versatile, durable, vegan, and cruelty-free.



Sustainability is a question of materials and processes. For vehicle seating systems and cutting-room suppliers, sustainability requires a strong focus on material and scrap management. This is an ongoing effort that enables continuous improvement in areas such as efficient labour use, optimal material use, and reduced waste.

To increase automotive interior sustainability, suppliers must:

- Consider the complete product lifecycle and its environmental impact
- Extend the useful life of final products
- Manage and recycle material during procurement and manufacturing processes
- Increase the use of raw materials with sustainable origins and high recycling features to improve scrap recovery
- Set targets to improve consumption of raw materials used in the cutting room (e.g., leather or fabric) to prevent excess waste and reduce overall material procurement costs
- Improve yields and reduce waste by increasing process quality and adopting and innovative solutions in the cutting room
- Optimise overall logistics and packaging processes by adopting sustainable solutions and green materials

The Integrated and Sustainable Lectra Value Proposition for the Automotive Cutting Room

To cope with CASE trends, sustainability challenges, automotive OEM requests, and increased customer sensibilities regarding sustainable and eco-friendly materials, Lectra structured its value proposition to maximise benefits from cutting room operations with a core focus on achieving zero buffer.

Here are 5 ways Lectra can help improve cutting room environmental sustainability and productivity:

- 1 Cut with zero buffer to minimise fabric waste
- 2 Reduce errors, scrap rate, and rework
- 3 Discard fewer consumables and spare parts
- 4 Decrease power consumption
- 5 Increase labour and productive efficiency by gaining process visibility

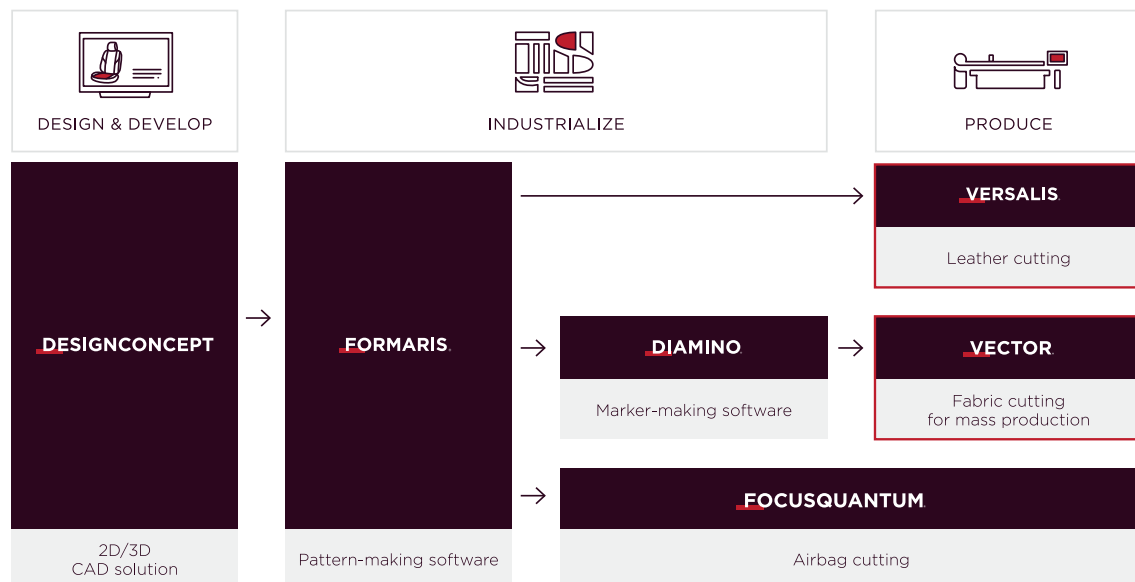
These are achievable with Lectra's value proposition and offerings, which positions it as a unique and integrated partner for cutting room operations in the automotive market. Its solutions include:

Vector Automotive iP series: The industry standard for multi-ply cutting

These solutions are specially designed to achieve zero-buffer cutting at the highest productivity level on the market. Thanks to major advances in hardware, software, and consumables, Vector Automotive iP6 and iP9 set the industry standard in terms of cutting accuracy, reliability, machine availability, and material efficiency for a wide range of automotive materials and cut parts.

Versalis Automotive: The digital cutting solution for optimal leather use and material savings

This is a digital leather cutting solution that derives maximum value from every hide to ensure a more efficient production cycle and increased yield efficiency, resulting in optimised leather use and savings. Precision hide analysis and cutting quality enable manufacturers to manage increasing complexity, manage fluctuating production batches, and minimise scrap. Powerful nesting capabilities enable zero-buffer cutting performance that increases material savings by up to 7% compared to a manual process.

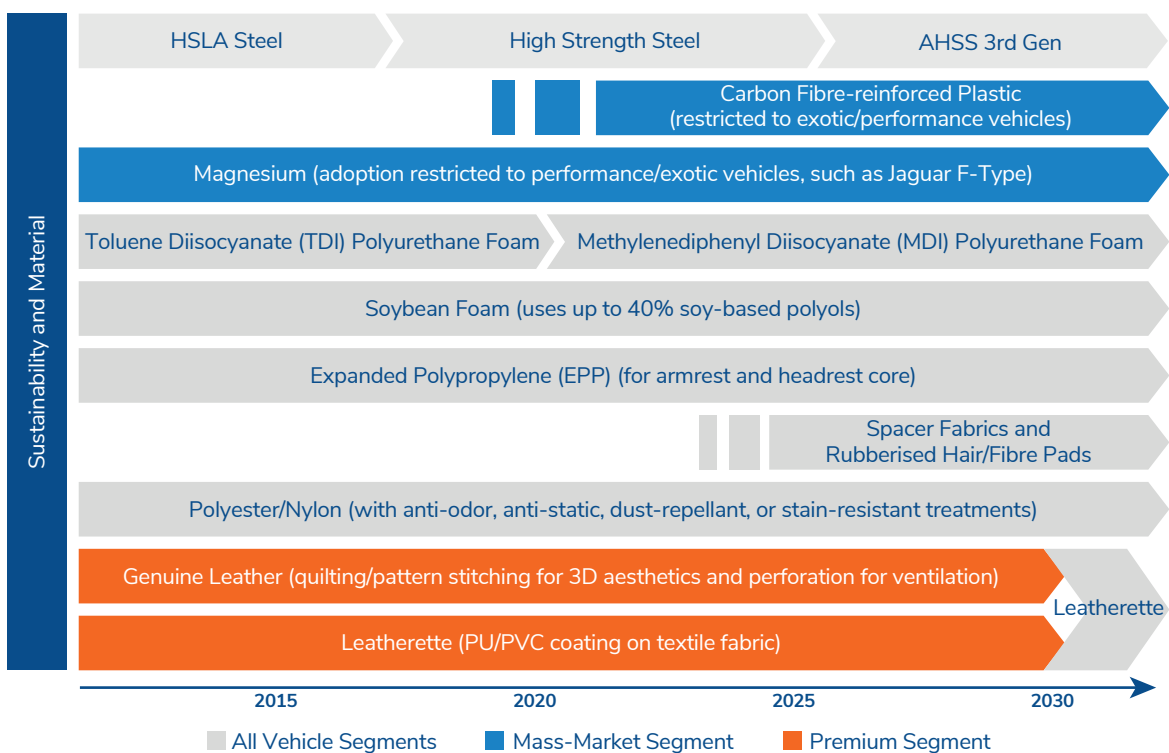


Last Word and Future Outlook

Frost & Sullivan expects the alternative leather and sustainable high-tech fabric market to reach \$120 billion by 2025. Technology and applications will be strongly driven by product positioning (e.g., mass-market or premium), by CASE platform and technological features (e.g., sensors, interior design, or human-machine interfaces), and by customer sensibility regarding overall value chain sustainability.

Seating System Materials: The Industry Roadmap

Light-weighting, sustainability, comfort, and convenience to health and wellness will drive future seating systems and vehicle interior design



At the same time, integrating an experienced partner into the value chain that can support common sustainability targets and goals will ensure economic and social competitiveness.

With CASE convergence, the automotive ecosystem will increasingly need sustainable solutions for the entire value chain. Along with lowering CO₂ emissions, material management will play a central role in ensuring long-term economic and social sustainability because the industry cannot rely solely on primary materials.

Automotive suppliers are reshaping their value proposition to respond to such challenges, specifically regarding the cutting room, by positioning themselves as strategic partners that support best-in-class sustainability targets through:

- Developing an efficient cutting room process that delivers zero-waste and almost zero-buffer cutting
- Reducing emissions and their environmental footprint
- Supporting CO₂ compensation via reforestation initiatives



Other operational best practices directly adopted in the cutting room could greatly contribute to meeting overall manufacturing process sustainability targets. These best practices include:

- Setting cutting room sustainability and operational targets and rigorously tracking progress with overall equipment effectiveness metrics (e.g., raw material consumption and the per cent yield of recycled material)
- Reducing scrap and rework in the fabric cutting processes
- Maximising machine uptime
- Shortening lead times by increasing production through high-ply cutting
- Optimising cutting quality for sustainable and innovative fabric types
- Investing in connected and Industry 4.0-compliant machinery

Key suppliers can improve overall sustainability and become strategic value chain partners by improving manufacturing process efficiency, matching evolving client demands, and meeting environmental targets.

Further Reading

- Article: [Going green in the automotive cutting room: 6 best practices](#)
- Article: [Cost reduction in the automotive fabric cutting room: A checklist of best practices](#)
- Customer Voice: [BOS Automotive significantly improved its cutting line performance, eliminating a work shift](#)
- Customer Voice: [Mario Levi chose Lectra to help it make the move to automated cutting](#)

F R O S T  S U L L I V A N

Growth is a journey. We are your guide.

For over six decades, Frost & Sullivan has provided actionable insights to corporations, governments and investors, resulting in a stream of innovative growth opportunities that allow them to maximize their economic potential, navigate emerging Mega Trends and shape a future based on sustainable growth.

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